

DEVELOPMENT AND SENSORY EVALUATION OF NOOTROPIC COOKIES FORTIFIED BARLEY FLOUR TO WHEAT FLOUR WITH MEDHYARASAYANA

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ABSTRACT

Cookies are more widely used staple food for human diet in both developed and developing countries and it is well accepted by consumers due to their sensory attributes, long shelf life and its ready to eat advantage. The objective of the present work is to improve the nutritional and the health benefit incorporation of barley flour and Medhya Rasayana to the wheat based cookies. These cookies improved protein, fat, fiber, ash, β -glucan and minerals (CA, P, K and Fe) with low moisture contents. It has nutritional benefit and which have therapeutic value and also health benefits. Sensory properties of the separation and roundness were not affected significantly; significant difference was seen in taste color and odor. These cookies are useful for all health of the people and increase cognitive abilities, memory enhancing, and longevity. These cookies can also be consumed as medicinal supplements for regular consumption and support to prevent many health problems and promote good health and increase immunity.

KEYWORDS: Medhya Rasayana, Attributes, β -Glucan, Longevity & Cognitive Abilities

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INTRODUCTION

In the present scenario, people are more conscious about health and making food choices based on a food's ability to provide health benefits, such as enhancing body functions or reducing the risk for certain disease. Currently, the healthy foods and drinks market is performing well, in terms of innovation and market satiety; according to A.C. Nielsen data (2007). Bakery products like bread, biscuits and cookies are used as most convenient cereal based products. These are all low cost products and are consumed all over the world, both urban and rural people (Avinash 2014). Cookies have a high content of carbohydrate, fat and low moisture. Wheat flour, sugar, salt is the principal ingredients used in bread, biscuits and cookies making (Gandhi et al., 2001). The bakery products can be used as a vehicle for incorporation of different nutritional rich and nootropic ingredients.

According to Food and Drug Administration (FDA), 3 grams of barley β -Glucan per day is sufficient dietary intake to achieve a decrease in serum total and low density lipoprotein cholesterol (Sullivan Petal). The importance in the application and the nutritional analysis of the BBG fractions was very successful in illustrating potential health benefits of foods. β -glucan shows promise in various food systems, including beverages, meat products, and bakery products, (Newman et al (1998) Barley (*Hordeumvulgare*) is rich in β - Glucan and its common Dhanya and traditional staple food in India. It's mainly used as feed for animals and for people used much as medicinal purpose not as a regular diet (Ramesh Chandra Kumawat). Barley considered to be most useful grain, as it is easily digestible compared wheat and other grain (Mohammad). But, still it remains underutilized as human food. Barley malt also can be substituted in to a lot of food stuffs such as biscuits, bread, crackers, cakes,

desserts, malted soft drink, sauce, soup and Ice cream etc. [TanerAkar] BBG fiber fractions in foods and in human nutrition, particularly where starch is a primary ingredient bread and pasta(C Brennan) overall quality of the breadwas acceptable up to 40% barley flour fortification, but harder and dark in colour (Basmanand Koksel, 2008) but more acceptable 15–30% barley flour and 20–30% barley flour prepared noodles are acceptable characteristics (Cheigh et al., 1976) up to 40% BF incorporated with wheat flour parota enriched with dietary fiber and b-glucan significantly increase water absorption and dough elasticity. 30% is more acceptable characteristics compared to 40% BF (G KoushikaMaiya) and it increases water absorption and dough elasticity, and decreases dough strength, extensibility and parotta-making characteristics of wheat flour. The 30% BF parotta showed increased contents of dietary fiber and b-glucan by 2.0 and 10.5 times, β -Glucan rich parotta on a large scale by the baking industries.(G KoushikaMaiya).

Nootropic herbs are called Medhy Rasayana in Ayurveda (Reena kulakarni et al.). *MedhyaRasayana* are group of medicinal plants described in Ayurveda (Indian system of medicine) with multi-fold benefits, specifically to improve memory and intellect by Prabhava (specific action). Nootropic in Ayurveda Medha means intellect and/or retention and Rasayana means a therapeutic procedure or preparation that on regular practice will boost nourishment, health, memory, intellect, immunity and hence longevity. (RenukaKulkarni 2012) Which have multi fold benefits, specifically to improve memory and intellect by their Prabhava (specific action) namely Medhya (Nootropic). The MedhyaRasayan is specifically intellect promoting and bestowing longevity. It also provides immunity against diseases, strength, complexion, voice and digestive capacity. The herbs used include juice of *Bacopamonnieri*, the powder of *Glycerrizaglabra* in milk, the juice of roots, stem and flowers of *Tinusporacordifolia* and paste of *Convolvulus pluricaulis* (CharakaSamihatha). Specially mentioned with a wide range of applications on different systems. Yet in practice, little more handful drugs used with same aim are mentioned elsewhere in the Ayurveda classical textbooks. They are *Aindri* (*Bacopamonniera*), *Jyothishmati* (*Celastruspanniculata*), *Kushmanda* (*Benincasahispida*), *Vacha* (*Acoruscalamus*) and *Jatamamsi* (*Nardostachysjatamamsi*). MedhyaRasayana are used either in polyherbal preparations or alone (Renukakulkarni 2012)

MATERIALS AND METHODS

Collected MedhyaRasayana (Nootropic) herbs [*Centella asiatica* (Mandukaparni), *Bacopamonnieri* (JalaBrahmi), *Withaniasomnifera* (Ashwagandha), *Clitoriaternatea* (shankapushpi) *Tinosporacordifolia* (Guduchi) *Acoruscalamus* (Vacha) Formulated Medhyarasayana according to Ayurveda classical method (Kulkarni Reena et al).

Table 1: Materials for Preparation of Cookies

Sl. No	Ingredients	Amount in GMs
1	Wheat and Barley premix dough 70:30 %, 60:40%	100
2	Jagerry (Brown sugar)	50
3	Cow Ghee	20
4	Butter	20
5	Yalachi (Cad mom) powder	3gms
6	Baking Powder	½ tea spoon
7	Salt	1.0
8	Date (Paste)	20
9	Water	20 to 40 ml

EXPERIMENTAL PROCEDURE

Preparation of Dough

Weigh all the ingredients, mix Brown sugar, Cow Ghee, vanilla, crushed date and baking powder and salt, and also the flour (wheat and barley premix dough) to make smooth dough thoroughly. Each 9 gms weighed premixed ingredients, add one gram of formulating Medhya Rasayana in the addition of water up to consistency mixing.

Preheat the oven 375°F. Drop dough on microwave baking tray rounded tablespoon full about 2 inches apart onto ungreased cookie sheet & cook at 100%. It has to be baked in an oven at 90°C for 18mts. The proximate analysis with respect to moisture, total ash content, protein, carbohydrate, and fat and fiber value was performed on newly formulated cookies by AOAC method. The level of active components of Medhya Rasayana analysis done by TLC method. Sensory evaluation was carried out by the panel of judges on nine Hedonic scales. The mean value score was given for each parameter like color, flavor, texture, mouth feel and overall acceptability.

Microbial analysis was performed by the standard plate count method (6). 1 ml of an aliquot of the sample was taken in a sterile Petri dish of both dilutions. Tryptone Glucose Beef extract was added in both the dishes, rotated the plates to mix the sample with agar diluents. Incubated the dishes for 48hrs at 37°C. Counted the colonies and calculated the Total Viable Count (TVC) per gram.

RESULTS AND DISCUSSIONS

Table 2: Chemical Parameters of the Newly Formulated Cookies

% Parameter	Fresh	1 st Week	2 nd Week	3 rd Week
Moisture	0.76	1.14	1.58	1.96
Total Ash	1.03	1.07	1.05	2.10
Acid Insoluble Ash	0.07	0.10	1.19	1.53
Carbohydrate	61.39	-	-	-
Protein	7.13	-	-	-
Fat	25.73	-	-	-
Dietary Fiber	0.79	-	-	--

From Table 2 Chemical parameter are studied for Fresh, First, Second and third week. It is observed that moisture, ash and acid values are increased as the days increased. The quality of the cookies is decreased and life span of the cookies also is reduced.

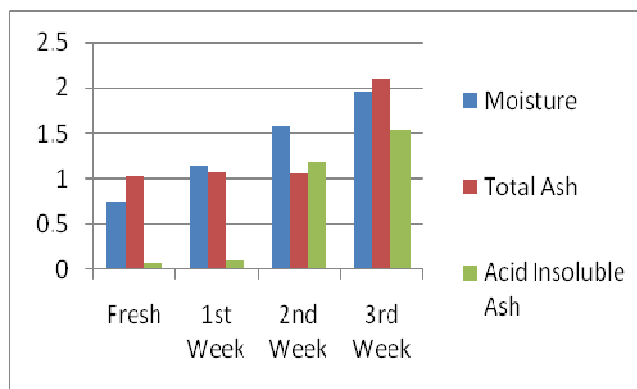


Figure 1: Shelf Life of Cookies

Table 3: Sensory Analysis of Barley Flour Fortified to Wheat Flour with Medhya Rasayana Churna Prepared Cookies

Characteristics	Fresh		1 st Week		2 nd Week		3 rd Week	
Wheat : Barley in %	70:30	60:40	70:30	60:40	70:30	60:40	70:30	60:40
Appearance (15)	13	13	12.0	12	11.3	11.2	8.9	8.9
Colour(15)	9.9	9.9	9.60	9.5	9.4	9.4	8.1	8.0
Crispiness(15)	10	9.7	9.1	9.0	7.9	7.5	5.1	4.9
Flavor(15)	12	12	10.0	10.0	6.8	6.8	5.1	5.1
Taste(15)	10	10	8.0	8.0	5.0	5.0	5.0	5.3
Texture(15)	9.1	9.1	9.3	9.0	5.9	5.9	5.3	5.5
Overall Acceptance (10)	7.3	7.3	5.8	5.8	5.1	5.0	5.0	5.0
Total (100)	73.3	71	64.1	63.3	51.4	50.8	42.5	42.7

From Table 3 There is no much significant difference from barley fortification 30 % and 40% shown in sensory analysis. When compared between first and third weeks, it is found that the overall quality of the cookies got decreased.

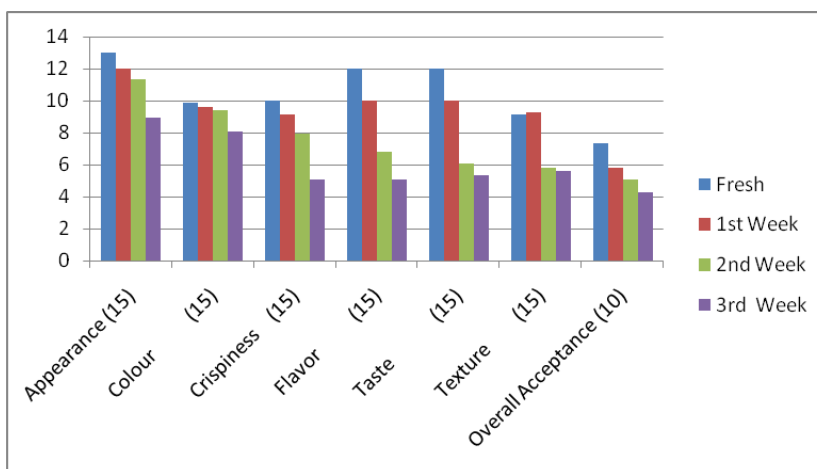


Figure 2: Sensory Analysis Formulated Cookies

CONCLUSIONS

Sensory properties of the separation and roundness were not affected significantly; there was no significant difference seen in taste color and odor 30% barley fortification. 40% fortification barley cookies had good texture and crispiness. These cookies are rich in carbohydrate, protein and fiber. It has high nutritive value and it holds good for all age groups from children to age hold people. Studies reveal that herbs retain active component, even after baking. These cookies are useful for all healthy people to increase cognitive abilities, enhanced memory, longevity and also to prevent diseases such as fatness, heart and blood vessel diseases. These cookies can also be consumed as medicinal supplements for regular consumption due to its ready to eat advantages. It supports to prevent many health problems and promote good health and increase immunity.

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